LIST OF CURRENT CLAIMS

1. (Currently Amended) A method for digitizing at least a subarea of the papillary structure of ~~the~~ skin, the subarea defining an intensity profile ~~(IP)~~ with a continuous intensity domain ~~(KI)~~, comprising the steps of:

- transforming the intensity profile ~~(IP)~~ into at least one analog electrical signal, and

- transforming said analog electrical signal into at least one digital signal ~~(DS, DS1, DS2)~~ with an intensity domain ~~(A1, A2) consisting of~~ comprising discrete intensity values ~~(W, W1, W2)~~ and a space domain comprising ~~consisting of~~ discrete positions,

~~characterized by the steps of~~

- repeatedly performing the transforming steps for the same subarea to form a plurality of different digital signals ~~(DS, DS1, DS2)~~, and

- combining the plurality of digital signals ~~(DS, DS1, DS2)~~ into a common digital papillary structure signal ~~(PS)~~ with an intensity domain ~~(DI)~~ formed from discrete intensity values ~~(W)~~ and a space domain formed from discrete positions in such a way that the intensity domain ~~(DI)~~ of the papillary structure signal ~~(PS)~~ has more intensity values ~~(W)~~ than the intensity domains of each single one of the plurality of digital signals ~~(DS, DS1, DS2)~~.

2. (Currently Amended) The method according to claim 1, wherein ~~characterized in that~~ the repeated performing of the transforming steps is done for different portions ~~(A1, A2)~~ of the continuous intensity domain ~~(KI)~~ in each case, so that after the combining step the intensity domain ~~(DI)~~ of the digital papillary structure signal ~~(PS)~~ covers a larger portion of the continuous intensity domain ~~(KI)~~ than the intensity domains of each single one of the plurality of digital signals ~~(DS, DS1, DS2)~~.

3. (Currently Amended) The method according to claim 2, wherein ~~characterized in that~~ upon the repeated performing of the transforming steps, the portions ~~(A1, A2)~~ of the continuous intensity domain ~~(KI)~~ are determined upon transforming the intensity profile ~~(IP)~~ into the analog electrical signal.

4. (Currently Amended) The method according to claim 3, wherein ~~characterized in that~~ the determination of the second and the further portions is carried out ~~done~~ by using ~~means of~~ data of the previous portion or portions.

5. (Currently Amended) The method according to claim 3, wherein ~~or 4, characterized in that~~ the number of intensity values ~~(W)~~ is determined by the choice or number of portions.

6. (Currently Amended) The method according to claim 3, wherein ~~any of claims 3 to 5, characterized in that~~ the transforming of the intensity profile ~~(IP)~~ into an analog electrical signal is done by a capacitive signal converter, and the portion ~~(A1, A2)~~ of the continuous intensity domain ~~(KI)~~ is determined by quantities of charge applied to ~~the~~ capacitors of the capacitive signal converter.

7. (Currently Amended) The method according to claim 2, wherein ~~characterized in that~~ upon the repeated performing of the transforming steps, the portions ~~(A1, A2)~~ of the continuous intensity domain ~~(KI)~~ are determined upon transforming the analog electrical signal into a digital signal ~~(DS, DS1, DS2)~~.

8. (Currently Amended) The method according to claim 7, wherein ~~characterized in that~~ the determination of the second and the further portions is carried out ~~done~~ by using ~~means of~~ data of the previous portion or portions.

9. (Currently Amended) The method according to claim 7, wherein ~~or 8, characterized in that~~ the number of intensity values ~~(W)~~ is determined by the choice or number of portions.

10. (Currently Amended) The method according to claim 2, wherein ~~any of claims 2 to 5, characterized in that~~ the portions ~~(A1, A2)~~ of the continuous intensity domain ~~(KI)~~ together cover the total continuous intensity domain ~~(KI)~~.

11. (Currently Amended) The method according to claim 2, wherein ~~any of claims 2 to 10, characterized in that~~ the portions ~~(A1, A2)~~ of the continuous intensity domain ~~(KI)~~ are adjacent and do not overlap.

12. (Currently Amended) The method according to claim 2, wherein ~~any of claims 2 to 10, characterized in that~~ the portions ~~(A1, A2)~~ of the continuous intensity domain ~~(KI)~~ overlap.

13. (Currently Amended) The method according to claim 1, wherein ~~any of claims 1 to 12, characterized in that~~ the repeated performing of the transforming steps is carried out ~~done~~ with different numbers of discrete intensity values ~~(W1, W2)~~ of the intensity domains of the digital signals ~~(DS, DS1, DS2)~~ in each case.

14. (Currently Amended) The method according to claim 1, wherein ~~any of claims 1 to 13, characterized in that~~ the combining step comprises the following substeps:

- estimating a discrete intensity value ~~(W)~~ for each discrete position of the digital papillary structure signal ~~(PS)~~ from the respective discrete intensity values ~~(W1, W2)~~ of the accordingly corresponding discrete positions of the digital signals ~~(DS, DS1, DS2)~~, and

- entering the estimated intensity value ~~(W)~~ at the corresponding discrete position of the digital papillary structure signal ~~(PS)~~.

15. (Currently Amended) The method according to claim 2, wherein ~~any of claims 2 to 12 with claim 14, characterized in that~~ the combining step comprises before the estimating and entering substeps the following substep:

- normalizing the intensity domains of the plurality of digital signals ~~(DS, DS1, DS2)~~ to the portion ~~(A1, A2)~~ of the continuous intensity domain ~~(KI)~~ detected by the respective digital signal ~~(DS, DS1, DS2)~~.

16. (Currently Amended) The method according to claim 15, wherein ~~characterized in that~~ upon the estimating step, only those discrete intensity values ~~(W1, W2)~~ of the accordingly corresponding positions of the digital signals ~~(DS, DS1, DS2)~~ are taken into account that do not represent a maximum or minimum intensity value ~~(W1, W2)~~ of the respective digital signal ~~(DS, DS1, DS2)~~.

17. (Currently Amended) The method according to claim 14, wherein ~~any of claims 14 to 16, characterized in that~~ upon the estimating step, the arithmetic mean of the discrete intensity values ~~(W1, W2)~~ of the accordingly corresponding positions of the digital signals ~~(DS, DS1, DS2)~~ is formed as the discrete intensity value ~~(W)~~ of a discrete position of the digital papillary structure signal ~~(PS)~~.

18. (Currently Amended) The method according to claim 1, wherein ~~any of claims 1 to 13, characterized in that~~ upon the repeated performing of the transforming steps, the continuous intensity domain ~~(KI)~~ is mapped to intensity domains of the plurality of digital signals ~~(DS, DS1, DS2)~~ with only two discrete intensity values ~~(W1, W2)~~ in each case, and wherein ~~whereby~~ for each of the plurality of digital signals ~~(DS, DS1, DS2)~~ a different threshold value is determined for partitioning the continuous intensity domain ~~(KI)~~ into two subdomains which are

each mapped to one of the two discrete intensity values ~~(W1, W2)~~ of each of the plurality of digital signals ~~(DS, DS1, DS2)~~.

19. (Currently Amended) The method according to claim 18, wherein ~~characterized in that~~ upon the combining step, the plurality of digital signals ~~(DS, DS1, DS2)~~ is added up.

20. (Currently Amended) The method according to claim 1, wherein ~~any of claims 1 to 17, characterized in that~~ upon the repeated performing of the transforming steps, digital color signals ~~(DS, DS1, DS2)~~ are produced, and a digital papillary structure color signal ~~(PS)~~ is produced therefrom upon the combining step.

21. (Currently Amended) An apparatus for digitizing at least a subarea of the papillary structure of ~~the~~ skin, the subarea defining an intensity profile ~~(IP)~~ with a continuous intensity domain ~~(KI)~~, comprising a transformation device ~~(TE)~~ for transforming the intensity profile ~~(IP)~~ into at least one analog electrical signal, and an analog/digital converter ~~(AD)~~ for transforming said analog electrical signal into at least one digital signal ~~(DS, DS1, DS2)~~ with an intensity domain comprising ~~consisting of~~ discrete intensity values ~~(W1, W2)~~ and a space domain comprising ~~consisting of~~ discrete positions, ~~characterized in that the apparatus further comprises:~~

[[-]] a control device ~~(SE)~~ which causes the transformation device ~~(TE)~~ and the analog/digital converter ~~(AD)~~ to produce a plurality of different digital signals ~~(DS, DS1, DS2)~~ for the same subarea, and

[[-]] a combination device ~~(KE)~~ which combines the plurality of digital signals ~~(DS, DS1, DS2)~~ into a common digital papillary structure signal ~~(PS)~~ with an intensity domain comprising ~~(DI) consisting of~~ discrete intensity values ~~(W)~~ and a space domain comprising ~~consisting of~~ discrete positions in such a way that the intensity domain ~~(DI)~~ of the digital papillary structure signal ~~(PS)~~ has more discrete

intensity values ~~(W)~~ than the intensity domains of each single one of the plurality of digital signals ~~(DS, DS1, DS2)~~.

22. (Currently Amended) The apparatus according to claim 17, wherein ~~characterized in that~~

- the control device is arranged to determine ~~(SE) determines~~ in each case different portions ~~(A1, A2)~~ of the continuous intensity domain ~~(KI)~~ of the intensity profile ~~(IP)~~ to be mapped to the intensity domain of the respective digital signal ~~(DS, DS1, DS2)~~, and
- the combination device (KE) is arranged to combine ~~combines~~ the plurality of digital signals ~~(DS, DS1, DS2)~~ in such a way that the intensity domain ~~(DI)~~ of the digital papillary structure signal ~~(PS)~~ covers a larger portion ~~(A1, A2)~~ of the continuous intensity domain ~~(KI)~~ than the intensity domains of each single one of the plurality of digital signals ~~(DS, DS1, DS2)~~.

23. (Currently Amended) The apparatus according to claim 22, including means for mapping ~~characterized in that~~ a portion ~~(A1, A2)~~ to be mapped of the continuous intensity domain ~~(KI)~~ of the intensity profile ~~(IP)~~ as determined by the control device ~~(SE) is mapped~~ to the analog electrical signal upon transformation of the intensity profile ~~(IP)~~ by the transformation device ~~(TE)~~.

24. (Currently Amended) The apparatus according to claim 22, wherein ~~or 23, characterized in that~~ the transformation device ~~(TE)~~ is a capacitive signal converter.

25. (Currently Amended) The apparatus according to claim 22, including means for mapping ~~characterized in that~~ a portion ~~(A1, A2)~~ to be mapped of the continuous intensity domain ~~(KI)~~ of the intensity profile ~~(IP)~~ as determined by the

control device ~~(SE) is mapped~~ to a digital signal ~~(DS, DS1, DS2)~~ upon transformation of the analog electrical signal by the analog/digital converter ~~(AD)~~.

26. (Currently Amended) The apparatus according to claim 22, wherein ~~any of claims 22 to 25, characterized in that~~ the control device is arranged to adjust ~~(SE) adjusts~~ the portions ~~(A1, A2)~~ to be mapped of the continuous intensity domain ~~(KI)~~ of the intensity profile ~~(IP)~~ in such a way that they altogether cover the total continuous intensity domain ~~(KI)~~.

27. (Currently Amended) The apparatus according to claim 21, wherein ~~any of claims 21 to 26, characterized in that~~ the control device is arranged to determine ~~(SE) determines~~ in each case different numbers of discrete intensity values ~~(W1, W2)~~ for the intensity domains of the digital signals ~~(DS, DS1, DS2)~~.

28. (Currently Amended) The apparatus according to claim 21, wherein ~~any of claims 21 to 26, characterized in that~~ the combination device is arranged to estimate ~~(KE) estimates~~ a discrete intensity value ~~(W)~~ for each discrete position of the digital papillary structure signal ~~(PS)~~ from the respective discrete intensity values ~~(W1, W2)~~ of the accordingly corresponding discrete positions of the digital signals ~~(DS, DS1, DS2)~~.

29. (Currently Amended) The apparatus according to claim 22, wherein ~~any of claims 22 to 26 with claim 28, characterized in that~~ the combination device ~~(KE)~~, before estimation of the discrete intensity values ~~(W)~~ of the digital papillary structure signal (PS), is arranged to normalize ~~normalizes~~ the intensity domains of the plurality of digital signals ~~(DS, DS1, DS2)~~ to the portion ~~(A1, A2)~~ of the continuous intensity domain ~~(KI)~~ detected by the respective digital signal ~~(DS, DS1, DS2)~~.

30. (Currently Amended) The apparatus according to claim 29, wherein ~~characterized in that~~ the combination device ~~(KE)~~, upon estimation of the discrete intensity values ~~(W)~~ of the digital papillary structure signal, is arranged to take ~~(PS), takes~~ into account only those intensity values ~~(W1, W2)~~ of the accordingly corresponding discrete positions of the digital signals ~~(DS, DS1, DS2)~~ that do not represent either the maximum or the minimum intensity value ~~(W1, W2)~~ of the particular intensity domain.

31. (Currently Amended) The apparatus according to claim 21, wherein: ~~any of claims 21 to 27, characterized in that~~

- the control device is arranged to determine ~~(SE) determines~~ for each of the plurality of digital signals ~~(DS, DS1, DS2)~~ intensity domains with only two discrete intensity values ~~(W1, W2)~~, and to determine ~~determines~~ for each digital signal ~~(DS, DS1, DS2)~~ a different threshold value for partitioning the continuous intensity domain ~~(KI)~~ into two subdomains, for mapping one of the subdomains to in each case one of the two discrete intensity values ~~(W1, W2)~~ of each of the plurality of digital signals ~~(DS, DS1, DS2)~~, and
- the combination device is arranged to add ~~(KE) adds~~ up the digital signals ~~(DS, DS1, DS2)~~.

32. (Currently Amended) The apparatus according to claim 21, wherein: ~~any of claims 21 to 30, characterized in that~~

- the transformation device ~~(TE)~~ and the analog/digital converter ~~(AD)~~ produce digital color signals ~~(DS, DS1, DS2)~~,
- the control device ~~(SE)~~ causes the transformation device ~~(TE)~~ and the analog/digital converter ~~(AD)~~ to produce a plurality of different digital color signals ~~(DS, DS1, DS2)~~ for the same subarea, and
- the combination device ~~(KE)~~ produces a digital papillary structure color signal ~~(PS)~~.